



SEQUENCE LISTING

<110> SATO, Makoto
NAGANO, Takashi

<120> Proteins with functions to regulate cell-migration and
cell-death

<130> 671302-2005

<140> 10/788,793

<141> 2004-02-27

<150> PCT/JP02/07676

<151> 2002-07-29

<1501> JP P2001-256910

<151> 2001-8-27

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<170> PatentIn Ver. 2.1

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1025	1030	1035 1040
Glu Lys Gln Thr Val Pro Ala Pro Val Arg Lys Tyr Asn Ser Asn Ala		
	1045	1050 1055
Asn Ile Ile Thr Thr Glu Asp Asn Lys Ile His Ile His Leu Gly Ser		
	1060	1065 1070
Gln Phe Lys Arg Ser Pro Gly Pro Ala Ala Glu Gly Val Ser Pro Val		
1075	1080	1085

Ile Thr Val Arg Pro Val Asn Val Thr Ala Glu Lys Glu Val Ser Thr
1090 1095 1100

Gly Thr Val Leu Arg Ser Pro Arg Asn His Leu Ser Ser Arg Pro Gly
1105 1110 1115 1120

Ala Ser Lys Val Thr Ser Thr Ile Thr Ile Thr Pro Val Thr Thr Ser
1125 1130 1135

Ser Thr Arg Gly Thr Gln Ser Val Ser Gly Gln Asp Gly Ser Ser Gln
1140 1145 1150

Arg Pro Thr Pro Thr Arg Ile Pro Met Ser Lys Gly Met Lys Ala Gly
1155 1160 1165

Lys Pro Val Val Ala Ala Ser Gly Ala Gly Asn Leu Thr Lys Phe Gln
1170 1175 1180

Pro Arg Ala Glu Thr Gln Ser Met Lys Ile Glu Leu Lys Lys Ser Ala
1185 1190 1195 1200

Ala Ser Ser Thr Ala Ser Leu Gly Gly Gly Lys Gly
1205 1210

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<213> Rattus norvegicus

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<222> (237).. (3131)

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ggttgaaaaa gctccttgaa caagaaaaag cttaccaagc ccgcaaagaa aaggaaaacg 180
ctaagcgget caacaaactt cgagatgagc ttgtgaagct caagtccttc gccctc atg 239
Met

ttg gtg gac gag agg cag atg cac atc gag caa ctg ggc ctg cag agt	287
Leu Val Asp Glu Arg Gln Met His Ile Glu Gln Leu Gly Leu Gln Ser	
5 10 15	
cag aaa gtc cag gac ctc act cag aag ctg agg gag gag gaa gaa aaa	335
Gln Lys Val Gln Asp Leu Thr Gln Lys Leu Arg Glu Glu Glu Glu Lys	
20 25 30	
ctc aaa gcg gtc act tac aaa tcc aag gaa gac cgc cag aag ctg ctc	383
Leu Lys Ala Val Thr Tyr Lys Ser Lys Glu Asp Arg Gln Lys Leu Leu	
35 40 45	
aag tta gaa gtg gac ttc gaa cac aag gcc tcg agg ttt tcc cag gag	431
Lys Leu Glu Val Asp Phe Glu His Lys Ala Ser Arg Phe Ser Gln Glu	
50 55 60 65	
cac gaa gag atg aac gcc aaa ttg gcg aat caa gaa tct cac aac cgg	479
His Glu Glu Met Asn Ala Lys Leu Ala Asn Gln Glu Ser His Asn Arg	
70 75 80	
caa ctt cga ctc aaa ctg gtt ggc tta tcg caa agg att gag gag ctg	527
Gln Leu Arg Leu Lys Leu Val Gly Leu Ser Gln Arg Ile Glu Glu Leu	
85 90 95	
gaa gag acc aat aaa agc ctt cag aag gca gag gaa gag ctc cag gag	575
Glu Glu Thr Asn Lys Ser Leu Gln Lys Ala Glu Glu Glu Leu Gln Glu	
100 105 110	
ctg aga gag aaa att gcc aaa ggg gaa tgt gga aac tcc agt ctc atg	623
Leu Arg Glu Lys Ile Ala Lys Gly Glu Cys Gly Asn Ser Ser Leu Met	
115 120 125	
gcg gaa gtg gag agt ctg cgc aag cgc gtg ctt gag atg gag ggc aag	671
Ala Glu Val Glu Ser Leu Arg Lys Arg Val Leu Glu Met Glu Gly Lys	
130 135 140 145	
gat gaa gag atc acg aag acc gag gcc cag tgc cgg gag ctg aag aag	719
Asp Glu Glu Ile Thr Lys Thr Glu Ala Gln Cys Arg Glu Leu Lys Lys	
150 155 160	
aag ctc caa gag gaa gaa cac cac agc aag gaa ctt aga cta gaa gtg	767
Lys Leu Gln Glu Glu Glu His His Ser Lys Glu Leu Arg Leu Glu Val	

165	170	175	
gag aag ctg cag aag agg atg tct	gag ctg gag aag ctg gag gaa gcg	815	
Glu Lys Leu Gln Lys Arg Met Ser	Glu Leu Glu Lys Leu Glu Glu Ala		
180	185	190	
ttc agc cgg agt aag tcg gaa tgc acc cag ctc cat ctg aac ctg gag	863		
Phe Ser Arg Ser Lys Ser Glu Cys Thr Gln Leu His Leu Asn Leu Glu			
195	200	205	
aag gag aag aac cta acc aaa gac ctg ctg aac gag ctg gag gtg gtc	911		
Lys Glu Lys Asn Leu Thr Lys Asp Leu Leu Asn Glu Leu Glu Val Val			
210	215	220	225
aag agt cga gtt aaa gaa ctc gaa tgc tcc gag agt aga ctg gag aag	959		
Lys Ser Arg Val Lys Glu Leu Glu Cys Ser Glu Ser Arg Leu Glu Lys			
230	235	240	
gcc gag tta agc ctc aaa gat gac ctt aca aag ctg aag tcc ttc act	1007		
Ala Glu Leu Ser Leu Lys Asp Asp Leu Thr Lys Leu Lys Ser Phe Thr			
245	250	255	
gtg atg ctg gtg gat gag agg aaa aat atg atg gag aaa ata aag caa	1055		
Val Met Leu Val Asp Glu Arg Lys Asn Met Met Glu Lys Ile Lys Gln			
260	265	270	
gaa gag agg aaa gtg gat ggg ttg aat aaa aac ttt aag gtg gag cag	1103		
Glu Glu Arg Lys Val Asp Gly Leu Asn Lys Asn Phe Lys Val Glu Gln			
275	280	285	
gga aaa gtc atg gat gtg acg gaa aag cta atc gag gaa agc aag aag	1151		
Gly Lys Val Met Asp Val Thr Glu Lys Leu Ile Glu Glu Ser Lys Lys			
290	295	300	305
ctt tta aaa ctc aaa tct gaa atg gag gaa aag gag tac agt ctg aca	1199		
Leu Leu Lys Leu Lys Ser Glu Met Glu Glu Lys Glu Tyr Ser Leu Thr			
310	315	320	
aag gag agg gat gag ctg atg ggt aaa ctg agg agc gaa gaa gaa agg	1247		
Lys Glu Arg Asp Glu Leu Met Gly Lys Leu Arg Ser Glu Glu Glu Arg			
325	330	335	
tcc tgt gaa ctg agc tgc agt gta gac tta cta aag aag cgg ctt gat	1295		
Ser Cys Glu Leu Ser Cys Ser Val Asp Leu Leu Lys Lys Arg Leu Asp			

340	345	350	
ggc ata gag gag gta gaa agg gaa ata aac cga ggt agg tcg tgc aag			1343
Gly Ile Glu Glu Val Glu Arg Glu Ile Asn Arg Gly Arg Ser Cys Lys			
355	360	365	
ggg tct gag ttc acc tgc ccg gaa gac aat aag atc aga gaa cta acg			1391
Gly Ser Glu Phe Thr Cys Pro Glu Asp Asn Lys Ile Arg Glu Leu Thr			
370	375	380	385
ctt gaa atc gag aga ctg aag aaa cgg ctc cag cag ttg gag gtg gtg			1439
Leu Glu Ile Glu Arg Leu Lys Lys Arg Leu Gln Gln Leu Glu Val Val			
390	395	400	
gag ggg gac ttg atg aag acc gag gac gaa tat gac cag ttg gag cag			1487
Glu Gly Asp Leu Met Lys Thr Glu Asp Glu Tyr Asp Gln Leu Glu Gln			
405	410	415	
aag ttc aga acc gag cag gat aag gca aac ttc ctc tcc cag cag ctc			1535
Lys Phe Arg Thr Glu Gln Asp Lys Ala Asn Phe Leu Ser Gln Gln Leu			
420	425	430	
gag gaa atc aaa cac caa atg gcc aag cac aaa gcc ata gag aaa ggg			1583
Glu Glu Ile Lys His Gln Met Ala Lys His Lys Ala Ile Glu Lys Gly			
435	440	445	
gag gcc gtg agc cag gaa gcc gaa ctg cga cac agg ttt cgg ctg gag			1631
Glu Ala Val Ser Gln Glu Ala Glu Leu Arg His Arg Phe Arg Leu Glu			
450	455	460	465
gag gct aaa agt cgt gat tta cag gcc gag gtg cag gct ctc aag gag			1679
Glu Ala Lys Ser Arg Asp Leu Gln Ala Glu Val Gln Ala Leu Lys Glu			
470	475	480	
aag atc cac gag ctg atg aac aag gaa gac cag ctg tct cag ctc caa			1727
Lys Ile His Glu Leu Met Asn Lys Glu Asp Gln Leu Ser Gln Leu Gln			
485	490	495	
gtc gac tat tcg gtc ctt cag caa aga ttt atg gaa gaa gaa act aag			1775
Val Asp Tyr Ser Val Leu Gln Gln Arg Phe Met Glu Glu Glu Thr Lys			
500	505	510	
aac aag aac atg ggg agg gag gtc ctc aat ctg acc aag gag cta gag			1823
Asn Lys Asn Met Gly Arg Glu Val Leu Asn Leu Thr Lys Glu Leu Glu			

515	520	525	
ctt tcc aag cgc tac agc cga gct ctc agg ccg agt ggg aac ggc cga			1871
Leu Ser Lys Arg Tyr Ser Arg Ala Leu Arg Pro Ser Gly Asn Gly Arg			
530	535	540	545
agg atg gtg gac gtg cct gtg gcc tcc act ggg gtg cag acc gag gcg			1919
Arg Met Val Asp Val Pro Val Ala Ser Thr Gly Val Gln Thr Glu Ala			
	550	555	560
gtg tgc ggg gat gct gcg gag gag gag acc ccg gct gtg ttc att cgc			1967
Val Cys Gly Asp Ala Ala Glu Glu Glu Thr Pro Ala Val Phe Ile Arg			
	565	570	575
aaa tcc ttc cag gag gaa aat cac atc atg agt aat ctt cga cag gta			2015
Lys Ser Phe Gln Glu Glu Asn His Ile Met Ser Asn Leu Arg Gln Val			
	580	585	590
ggc ctg aag aaa ccc atg gaa cgg tcc tcg gtc ctc gac agg tat ccc			2063
Gly Leu Lys Lys Pro Met Glu Arg Ser Ser Val Leu Asp Arg Tyr Pro			
	595	600	605
cca gca gcg aat gag ctc acc atg agg aag tct tgg att cct tgg atg			2111
Pro Ala Ala Asn Glu Leu Thr Met Arg Lys Ser Trp Ile Pro Trp Met			
610	615	620	625
aga aaa aga gaa aac ggt cct tcc act ccg cag gag aaa ggg ccc agg			2159
Arg Lys Arg Glu Asn Gly Pro Ser Thr Pro Gln Glu Lys Gly Pro Arg			
	630	635	640
cca aac cag ggt gca ggg cac ccc ggg gag ctg gtc cta gca cca aag			2207
Pro Asn Gln Gly Ala Gly His Pro Gly Glu Leu Val Leu Ala Pro Lys			
	645	650	655
cag ggc cag ccc cta cac atc cgt gtg aca cca gat cat gag aac agc			2255
Gln Gly Gln Pro Leu His Ile Arg Val Thr Pro Asp His Glu Asn Ser			
	660	665	670
act gcc acc ctg gag atc aca agc ccc aca tct gaa gag ttt ttc tct			2303
Thr Ala Thr Leu Glu Ile Thr Ser Pro Thr Ser Glu Glu Phe Phe Ser			
	675	680	685
agt acc acc gtc att cct acc tta ggc aac cag aaa cca aga ata acc			2351
Ser Thr Thr Val Ile Pro Thr Leu Gly Asn Gln Lys Pro Arg Ile Thr			

690	695	700	705	
att att cca tca ccc aat gtc atg tcg caa aag ccc aaa agt gca gat				2399
Ile Ile Pro Ser Pro Asn Val Met Ser Gln Lys Pro Lys Ser Ala Asp				
	710	715	720	
cct act ctc ggc cca gaa cga gcc atg tcc cct gtc acg att act act				2447
Pro Thr Leu Gly Pro Glu Arg Ala Met Ser Pro Val Thr Ile Thr Thr				
	725	730	735	
att tcc aga gag aag agc ccg gaa ggt gga agg agc gcc ttt gcc gac				2495
Ile Ser Arg Glu Lys Ser Pro Glu Gly Gly Arg Ser Ala Phe Ala Asp				
	740	745	750	
agg cct gca tcc ccc atc caa atc atg acg gtg tca aca tct gca gct				2543
Arg Pro Ala Ser Pro Ile Gln Ile Met Thr Val Ser Thr Ser Ala Ala				
	755	760	765	
ccc act gaa atc gct gtc tct cct gaa tct cag gaa gtg cct atg gga				2591
Pro Thr Glu Ile Ala Val Ser Pro Glu Ser Gln Glu Val Pro Met Gly				
770	775	780	785	
agg act atc ctc aaa gtc acc ccg gaa aaa caa act gtt cca gcc ccc				2639
Arg Thr Ile Leu Lys Val Thr Pro Glu Lys Gln Thr Val Pro Ala Pro				
	790	795	800	
gtg cgg aag tac aac tcc aat gct aat atc atc acc acg gaa gac aat				2687
Val Arg Lys Tyr Asn Ser Asn Ala Asn Ile Ile Thr Thr Glu Asp Asn				
	805	810	815	
aaa att cac att cac ctg ggt tct cag ttt aag cga tct cct ggg cct				2735
Lys Ile His Ile His Leu Gly Ser Gln Phe Lys Arg Ser Pro Gly Pro				
	820	825	830	
gcc gct gaa ggc gtg agc cca gtt atc acc gtc cgg cct gtc aac gtg				2783
Ala Ala Glu Gly Val Ser Pro Val Ile Thr Val Arg Pro Val Asn Val				
	835	840	845	
aca gcg gag aag gag gtt tct aca ggc aca gtc ctt cgc tct ccc agg				2831
Thr Ala Glu Lys Glu Val Ser Thr Gly Thr Val Leu Arg Ser Pro Arg				
850	855	860	865	
aac cac ctc tct tca aga ccc ggt gct agc aaa gtg acc agc act ata				2879
Asn His Leu Ser Ser Arg Pro Gly Ala Ser Lys Val Thr Ser Thr Ile				

870	875	880	
act ata acc ccg gtc aca acg tca tcc aca cga gga acc caa tca gtg			2927
Thr Ile Thr Pro Val Thr Thr Ser Ser Thr Arg Gly Thr Gln Ser Val			
885	890	895	
tca gga caa gat ggg tca tct cag cgg cct acc ccc acc cgc att cct			2975
Ser Gly Gln Asp Gly Ser Ser Gln Arg Pro Thr Pro Thr Arg Ile Pro			
900	905	910	
atg tca aaa ggt atg aaa gct gga aag cca gta gtg gca gcc tca gga			3023
Met Ser Lys Gly Met Lys Ala Gly Lys Pro Val Val Ala Ala Ser Gly			
915	920	925	
gca gga aat ctg acc aaa ttc cag cct cga gct gag act cag tct atg			3071
Ala Gly Asn Leu Thr Lys Phe Gln Pro Arg Ala Glu Thr Gln Ser Met			
930	935	940	945
aaa ata gag ctg aag aaa tct gca gcc agc agc act gcc tct ctt gga			3119
Lys Ile Glu Leu Lys Lys Ser Ala Ala Ser Ser Thr Ala Ser Leu Gly			
950	955	960	
ggg ggg aag ggc tgagggcagt ggctaagggg gtatgttgta aggatgctac			3171
Gly Gly Lys Gly			
965			
tgctgcagtg gaaacaaacc ttctctgtg ccaacccttt ccttgtagta ctaatttaag			3231
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cattttgcac tatcaagcca tgagtttgat atatgggtta taagaaaaga atactttcag			3651
agctatcaca gggctctctaa acttttggaa aaacaaaagc ccctaatatg acctcaggaa			3711

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aaaaaaaaaa aaaa

3785

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<211> 965

<212> PRT

<213> Rattus norvegicus

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20 25 30

Lys Leu Lys Ala Val Thr Tyr Lys Ser Lys Glu Asp Arg Gln Lys Leu
35 40 45

Leu Lys Leu Glu Val Asp Phe Glu His Lys Ala Ser Arg Phe Ser Gln
50 55 60

Glu His Glu Glu Met Asn Ala Lys Leu Ala Asn Gln Glu Ser His Asn
65 70 75 80

Arg Gln Leu Arg Leu Lys Leu Val Gly Leu Ser Gln Arg Ile Glu Glu
85 90 95

Leu Glu Glu Thr Asn Lys Ser Leu Gln Lys Ala Glu Glu Glu Leu Gln
100 105 110

Glu Leu Arg Glu Lys Ile Ala Lys Gly Glu Cys Gly Asn Ser Ser Leu
115 120 125

Met Ala Glu Val Glu Ser Leu Arg Lys Arg Val Leu Glu Met Glu Gly
130 135 140

Lys Asp Glu Glu Ile Thr Lys Thr Glu Ala Gln Cys Arg Glu Leu Lys
145 150 155 160

Lys Lys Leu Gln Glu Glu Glu His His Ser Lys Glu Leu Arg Leu Glu
165 170 175

Val	Glu	Lys	Leu	Gln	Lys	Arg	Met	Ser	Glu	Leu	Glu	Lys	Leu	Glu	Glu	180	185	190
Ala	Phe	Ser	Arg	Ser	Lys	Ser	Glu	Cys	Thr	Gln	Leu	His	Leu	Asn	Leu	195	200	205
Glu	Lys	Glu	Lys	Asn	Leu	Thr	Lys	Asp	Leu	Leu	Asn	Glu	Leu	Glu	Val	210	215	220
Val	Lys	Ser	Arg	Val	Lys	Glu	Leu	Glu	Cys	Ser	Glu	Ser	Arg	Leu	Glu	225	230	235
Lys	Ala	Glu	Leu	Ser	Leu	Lys	Asp	Asp	Leu	Thr	Lys	Leu	Lys	Ser	Phe	245	250	255
Thr	Val	Met	Leu	Val	Asp	Glu	Arg	Lys	Asn	Met	Met	Glu	Lys	Ile	Lys	260	265	270
Gln	Glu	Glu	Arg	Lys	Val	Asp	Gly	Leu	Asn	Lys	Asn	Phe	Lys	Val	Glu	275	280	285
Gln	Gly	Lys	Val	Met	Asp	Val	Thr	Glu	Lys	Leu	Ile	Glu	Glu	Ser	Lys	290	295	300
Lys	Leu	Leu	Lys	Leu	Lys	Ser	Glu	Met	Glu	Glu	Lys	Glu	Tyr	Ser	Leu	305	310	315
Thr	Lys	Glu	Arg	Asp	Glu	Leu	Met	Gly	Lys	Leu	Arg	Ser	Glu	Glu	Glu	325	330	335
Arg	Ser	Cys	Glu	Leu	Ser	Cys	Ser	Val	Asp	Leu	Leu	Lys	Lys	Arg	Leu	340	345	350
Asp	Gly	Ile	Glu	Glu	Val	Glu	Arg	Glu	Ile	Asn	Arg	Gly	Arg	Ser	Cys	355	360	365
Lys	Gly	Ser	Glu	Phe	Thr	Cys	Pro	Glu	Asp	Asn	Lys	Ile	Arg	Glu	Leu	370	375	380
Thr	Leu	Glu	Ile	Glu	Arg	Leu	Lys	Lys	Arg	Leu	Gln	Gln	Leu	Glu	Val	385	390	395
Val	Glu	Gly	Asp	Leu	Met	Lys	Thr	Glu	Asp	Glu	Tyr	Asp	Gln	Leu	Glu	405	410	415

Gln Lys Phe Arg Thr Glu Gln Asp Lys Ala Asn Phe Leu Ser Gln Gln
420 425 430

Leu Glu Glu Ile Lys His Gln Met Ala Lys His Lys Ala Ile Glu Lys
435 440 445

Gly Glu Ala Val Ser Gln Glu Ala Glu Leu Arg His Arg Phe Arg Leu
450 455 460

Glu Glu Ala Lys Ser Arg Asp Leu Gln Ala Glu Val Gln Ala Leu Lys
465 470 475 480

Glu Lys Ile His Glu Leu Met Asn Lys Glu Asp Gln Leu Ser Gln Leu
485 490 495

Gln Val Asp Tyr Ser Val Leu Gln Gln Arg Phe Met Glu Glu Glu Thr
500 505 510

Lys Asn Lys Asn Met Gly Arg Glu Val Leu Asn Leu Thr Lys Glu Leu
515 520 525

Glu Leu Ser Lys Arg Tyr Ser Arg Ala Leu Arg Pro Ser Gly Asn Gly
530 535 540

Arg Arg Met Val Asp Val Pro Val Ala Ser Thr Gly Val Gln Thr Glu
545 550 555 560

Ala Val Cys Gly Asp Ala Ala Glu Glu Glu Thr Pro Ala Val Phe Ile
565 570 575

Arg Lys Ser Phe Gln Glu Glu Asn His Ile Met Ser Asn Leu Arg Gln
580 585 590

Val Gly Leu Lys Lys Pro Met Glu Arg Ser Ser Val Leu Asp Arg Tyr
595 600 605

Pro Pro Ala Ala Asn Glu Leu Thr Met Arg Lys Ser Trp Ile Pro Trp
610 615 620

Met Arg Lys Arg Glu Asn Gly Pro Ser Thr Pro Gln Glu Lys Gly Pro
625 630 635 640

Arg Pro Asn Gln Gly Ala Gly His Pro Gly Glu Leu Val Leu Ala Pro

	645		650		655
Lys Gln Gly Gln Pro Leu His Ile Arg Val Thr Pro Asp His Glu Asn					
	660		665		670
Ser Thr Ala Thr Leu Glu Ile Thr Ser Pro Thr Ser Glu Glu Phe Phe					
	675		680		685
Ser Ser Thr Thr Val Ile Pro Thr Leu Gly Asn Gln Lys Pro Arg Ile					
	690		695		700
Thr Ile Ile Pro Ser Pro Asn Val Met Ser Gln Lys Pro Lys Ser Ala					
	705		710		720
Asp Pro Thr Leu Gly Pro Glu Arg Ala Met Ser Pro Val Thr Ile Thr					
	725		730		735
Thr Ile Ser Arg Glu Lys Ser Pro Glu Gly Gly Arg Ser Ala Phe Ala					
	740		745		750
Asp Arg Pro Ala Ser Pro Ile Gln Ile Met Thr Val Ser Thr Ser Ala					
	755		760		765
Ala Pro Thr Glu Ile Ala Val Ser Pro Glu Ser Gln Glu Val Pro Met					
	770		775		780
Gly Arg Thr Ile Leu Lys Val Thr Pro Glu Lys Gln Thr Val Pro Ala					
	785		790		800
Pro Val Arg Lys Tyr Asn Ser Asn Ala Asn Ile Ile Thr Thr Glu Asp					
	805		810		815
Asn Lys Ile His Ile His Leu Gly Ser Gln Phe Lys Arg Ser Pro Gly					
	820		825		830
Pro Ala Ala Glu Gly Val Ser Pro Val Ile Thr Val Arg Pro Val Asn					
	835		840		845
Val Thr Ala Glu Lys Glu Val Ser Thr Gly Thr Val Leu Arg Ser Pro					
	850		855		860
Arg Asn His Leu Ser Ser Arg Pro Gly Ala Ser Lys Val Thr Ser Thr					
	865		870		880

Ile Thr Ile Thr Pro Val Thr Thr Ser Ser Thr Arg Gly Thr Gln Ser
885 890 895

Val Ser Gly Gln Asp Gly Ser Ser Gln Arg Pro Thr Pro Thr Arg Ile
900 905 910

Pro Met Ser Lys Gly Met Lys Ala Gly Lys Pro Val Val Ala Ala Ser
915 920 925

Gly Ala Gly Asn Leu Thr Lys Phe Gln Pro Arg Ala Glu Thr Gln Ser
930 935 940

Met Lys Ile Glu Leu Lys Lys Ser Ala Ala Ser Ser Thr Ala Ser Leu
945 950 955 960

Gly Gly Gly Lys Gly
965

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<211> 4247
<212> DNA
<213> Homo sapiens

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<221> CDS
<222> (7).. (3645)

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gtggga atg aga tct cga aac caa ggt ggt gaa agt gca tct gat ggg 48
Met Arg Ser Arg Asn Gln Gly Gly Glu Ser Ala Ser Asp Gly
1 5 10

cat atc tcc tgt ccc aag ccc tcc atc atc ggc aat gct ggt gaa aaa 96
His Ile Ser Cys Pro Lys Pro Ser Ile Ile Gly Asn Ala Gly Glu Lys
15 20 25 30

agt ctc tca gaa gat gca aaa aag aag aag aaa tca aat agg aag gag 144
Ser Leu Ser Glu Asp Ala Lys Lys Lys Lys Lys Ser Asn Arg Lys Glu
35 40 45

gat gat gtc atg gcc tca gga act gtc aaa cga cac cta aaa aca tct 192
Asp Asp Val Met Ala Ser Gly Thr Val Lys Arg His Leu Lys Thr Ser
50 55 60

gga gaa tgt gaa cga aaa act aag aaa tcc ctg gag tta tcc aaa gaa	240
Gly Glu Cys Glu Arg Lys Thr Lys Lys Ser Leu Glu Leu Ser Lys Glu	
65 70 75	
gac ctc atc caa cta ctc agt ata atg gaa ggg gag ttg cag gcc aga	288
Asp Leu Ile Gln Leu Leu Ser Ile Met Glu Gly Glu Leu Gln Ala Arg	
80 85 90	
gaa gat gtg atc cac atg ctg aag aca gag aaa acc aag cct gag gtt	336
Glu Asp Val Ile His Met Leu Lys Thr Glu Lys Thr Lys Pro Glu Val	
95 100 105 110	
ctg gag gct cat tac ggg tct gcg gag cca gag aaa gtg ctg cgg gtc	384
Leu Glu Ala His Tyr Gly Ser Ala Glu Pro Glu Lys Val Leu Arg Val	
115 120 125	
ctg cac cga gat gcc att ctt gcc cag gag aaa tcc ata gga gaa gat	432
Leu His Arg Asp Ala Ile Leu Ala Gln Glu Lys Ser Ile Gly Glu Asp	
130 135 140	
gtc tat gag aaa ccg att tca gag ctg gac aga ctt gag gaa aaa cag	480
Val Tyr Glu Lys Pro Ile Ser Glu Leu Asp Arg Leu Glu Glu Lys Gln	
145 150 155	
aaa gaa acc tac cgg cgc atg cta gag cag ctg ttg ctg gcc gag aag	528
Lys Glu Thr Tyr Arg Arg Met Leu Glu Gln Leu Leu Leu Ala Glu Lys	
160 165 170	
tgt cat agg cgc acc gta tac gag tta gag aac gag aag cat aaa cac	576
Cys His Arg Arg Thr Val Tyr Glu Leu Glu Asn Glu Lys His Lys His	
175 180 185 190	
act gac tac atg aac aag agc gac gac ttc acc aac ctg ctg gag cag	624
Thr Asp Tyr Met Asn Lys Ser Asp Asp Phe Thr Asn Leu Leu Glu Gln	
195 200 205	
gag cgg gag agg tta aaa aag ctc ctt gaa caa gaa aag gct tat caa	672
Glu Arg Glu Arg Leu Lys Lys Leu Leu Glu Gln Glu Lys Ala Tyr Gln	
210 215 220	
gcc cgc aaa gaa aag gaa aat gct aaa cga ctc aat aaa cta aga gat	720
Ala Arg Lys Glu Lys Glu Asn Ala Lys Arg Leu Asn Lys Leu Arg Asp	
225 230 235	

gag ctt gtt aaa ctc aaa tcc ttt gca ctc atg ctg gtg gat gaa aga	768
Glu Leu Val Lys Leu Lys Ser Phe Ala Leu Met Leu Val Asp Glu Arg	
240 245 250	
caa atg cac att gaa caa ctt ggc ctg caa agc cag aaa gta cag gat	816
Gln Met His Ile Glu Gln Leu Gly Leu Gln Ser Gln Lys Val Gln Asp	
255 260 265 270	
ctt act cag aag ctg agg gaa gaa gaa gag aag ctc aaa gcc att act	864
Leu Thr Gln Lys Leu Arg Glu Glu Glu Lys Leu Lys Ala Ile Thr	
275 280 285	
tcc aaa tcc aaa gaa gac aga cag aaa ttg ctc aag tta gaa gtg gac	912
Ser Lys Ser Lys Glu Asp Arg Gln Lys Leu Leu Lys Leu Glu Val Asp	
290 295 300	
ttt gaa cac aag gct tcg agg ttt tct caa gag cat gaa gag atg aac	960
Phe Glu His Lys Ala Ser Arg Phe Ser Gln Glu His Glu Glu Met Asn	
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gct aaa ctg gct aat caa gag tct cac aat agg caa ctt aga ctc aag	1008
Ala Lys Leu Ala Asn Gln Glu Ser His Asn Arg Gln Leu Arg Leu Lys	
320 325 330	
ctg gtt ggc tta acc caa aga atc gag gag cta gaa gag acc aac aaa	1056
Leu Val Gly Leu Thr Gln Arg Ile Glu Glu Leu Glu Glu Thr Asn Lys	
335 340 345 350	
aat ctg cag aag gca gag gaa gaa ctt caa gaa tta aga gat aaa att	1104
Asn Leu Gln Lys Ala Glu Glu Glu Leu Gln Glu Leu Arg Asp Lys Ile	
355 360 365	
gcc aaa gga gaa tgt gga aac tct agc ctc atg gca gaa gtg gaa aat	1152
Ala Lys Gly Glu Cys Gly Asn Ser Ser Leu Met Ala Glu Val Glu Asn	
370 375 380	
ctt cga aag cgt gtg ctt gaa atg gaa ggt aaa gat gag gag atc act	1200
Leu Arg Lys Arg Val Leu Glu Met Glu Gly Lys Asp Glu Glu Ile Thr	
385 390 395	
aaa act gaa tcc cag tgt agg gaa ttg agg aag aag ctg caa gag gaa	1248
Lys Thr Glu Ser Gln Cys Arg Glu Leu Arg Lys Lys Leu Gln Glu Glu	
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gaa cac cat agt aag gag ctc aga ctt gaa gtt gag aag cta cag aag																1296
Glu His His Ser Lys	Glu Leu Arg Leu Glu Val Glu Lys Leu Gln Lys	415	420	425	430											
aga atg tct gaa cta gag aaa ttg gaa gaa gca ttt agc aag agt aaa																1344
Arg Met Ser Glu Leu Glu Lys Leu Glu Glu Ala Phe Ser Lys Ser Lys	435	440	445													
tct gag tgc acc cag cta cat tta aat ctg gag aaa gaa aag aac tta																1392
Ser Glu Cys Thr Gln Leu His Leu Asn Leu Glu Lys Glu Lys Asn Leu	450	455	460													
acc aaa gac ctg cta aat gaa ttg gag gtg gtc aag agt cga gtt aaa																1440
Thr Lys Asp Leu Leu Asn Glu Leu Glu Val Val Lys Ser Arg Val Lys	465	470	475													
gaa ttg gaa tgt tct gaa agt aga ttg gaa aag gct gaa tta agc cta																1488
Glu Leu Glu Cys Ser Glu Ser Arg Leu Glu Lys Ala Glu Leu Ser Leu	480	485	490													
aaa gat gat ctt acc aag ttg aag tca ttt acc gtg atg ctg gtt gat																1536
Lys Asp Asp Leu Thr Lys Leu Lys Ser Phe Thr Val Met Leu Val Asp	495	500	505	510												
gaa agg aaa aat atg atg gaa aaa ata aaa caa gaa gag aga aaa gtg																1584
Glu Arg Lys Asn Met Met Glu Lys Ile Lys Gln Glu Glu Arg Lys Val	515	520	525													
gat gga ctc aat aaa aat ttt aag gtg gaa caa gga aaa gtt atg gat																1632
Asp Gly Leu Asn Lys Asn Phe Lys Val Glu Gln Gly Lys Val Met Asp	530	535	540													
gta act gaa aaa cta att gaa gaa agt aag aaa ctt tta aaa cta aaa																1680
Val Thr Glu Lys Leu Ile Glu Glu Ser Lys Lys Leu Leu Lys Leu Lys	545	550	555													
tct gaa atg gag gaa aaa gta tac aac ttg aca aga gaa aga gat gag																1728
Ser Glu Met Glu Glu Lys Val Tyr Asn Leu Thr Arg Glu Arg Asp Glu	560	565	570													
ttg ata ggc aaa ttg aaa agt gaa gaa gaa aaa tcc tct gaa tta agc																1776
Leu Ile Gly Lys Leu Lys Ser Glu Glu Glu Lys Ser Ser Glu Leu Ser	575	580	585	590												

tgc agt gtt gac tta cta aag aag aga ctt gat ggt ata gag gaa gtg	1824
Cys Ser Val Asp Leu Leu Lys Lys Arg Leu Asp Gly Ile Glu Glu Val	
595 600 605	
 gaa aga gaa ata aca aga gga agg tca cga aaa ggg tct gag ctc acc	1872
Glu Arg Glu Ile Thr Arg Gly Arg Ser Arg Lys Gly Ser Glu Leu Thr	
610 615 620	
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Cys Pro Glu Asp Asn Lys Ile Lys Glu Leu Thr Leu Glu Ile Glu Arg	
625 630 635	
 ctg aag aaa cgt ctc caa caa ttg gaa gtg gtc gaa ggg gat ttg atg	1968
Leu Lys Lys Arg Leu Gln Gln Leu Glu Val Val Glu Gly Asp Leu Met	
640 645 650	
 aag aca gaa gat gag tat gat cag ctg gaa cag aaa ttt aga act gag	2016
Lys Thr Glu Asp Glu Tyr Asp Gln Leu Glu Gln Lys Phe Arg Thr Glu	
655 660 665 670	
 cag gat aag gct aac ttc ctc tct caa caa cta gag gag atc aag cac	2064
Gln Asp Lys Ala Asn Phe Leu Ser Gln Gln Leu Glu Glu Ile Lys His	
675 680 685	
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Gln Ile Ala Lys Asn Lys Ala Ile Glu Lys Gly Glu Val Val Ser Gln	
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Glu Ala Glu Leu Arg His Arg Phe Arg Leu Glu Glu Ala Lys Ser Arg	
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 gac tta aaa gcc gaa gta caa gct ctt aaa gag aag att cac gaa tta	2208
Asp Leu Lys Ala Glu Val Gln Ala Leu Lys Glu Lys Ile His Glu Leu	
720 725 730	
 atg aac aaa gaa gat cag ctt tct cag ctc cag gta gat tat tct gta	2256
Met Asn Lys Glu Asp Gln Leu Ser Gln Leu Gln Val Asp Tyr Ser Val	
735 740 745 750	
 ctt caa caa aga ttt atg gaa gaa gaa aat aag aac aaa aac atg ggg	2304
Leu Gln Gln Arg Phe Met Glu Glu Glu Asn Lys Asn Lys Asn Met Gly	
755 760 765	

cag gag gtt ctc aat ctg acc aaa gag ttg gag ctt tcc aag cgc tac	2352
Gln Glu Val Leu Asn Leu Thr Lys Glu Leu Glu Leu Ser Lys Arg Tyr	
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Ser Arg Ala Leu Arg Pro Ser Val Asn Gly Arg Arg Met Val Asp Val	
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Pro Val Thr Ser Thr Gly Val Gln Thr Asp Ala Val Ser Gly Glu Ala	
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Ala Glu Glu Glu Thr Pro Ala Val Phe Ile Arg Lys Ser Phe Gln Glu	
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Glu Asn His Ile Met Ser Asn Leu Arg Gln Val Gly Leu Lys Lys Pro	
835 840 845	
gtg gaa aga tct tct gtt cta gac agg tat cct cca gca gca aat gag	2592
Val Glu Arg Ser Ser Val Leu Asp Arg Tyr Pro Pro Ala Ala Asn Glu	
850 855 860	
ctc act atg aga aag tct tgg att cca tgg atg aga aag agg gaa aac	2640
Leu Thr Met Arg Lys Ser Trp Ile Pro Trp Met Arg Lys Arg Glu Asn	
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Gly Pro Ser Ile Thr Gln Glu Lys Gly Pro Arg Thr Asn Ser Ser Pro	
880 885 890	
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Gly His Pro Gly Glu Val Val Leu Ser Pro Lys Gln Gly Gln Pro Leu	
895 900 905 910	
cat att cga gtg aca cca gac cac gag aac agc act gcg act ttg gag	2784
His Ile Arg Val Thr Pro Asp His Glu Asn Ser Thr Ala Thr Leu Glu	
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ata aca agc ccg aca tct gaa gaa ttt ttt tct agt acc act gtc att	2832
Ile Thr Ser Pro Thr Ser Glu Glu Phe Phe Ser Ser Thr Thr Val Ile	
930 935 940	

cct acc tta ggg aat cag aaa cca aga ata acc att att cca tca cca	2880
Pro Thr Leu Gly Asn Gln Lys Pro Arg Ile Thr Ile Ile Pro Ser Pro	
945 950 955	
aac gtt atg cct caa aaa caa aaa agt gga gat act act ctt ggc cca	2928
Asn Val Met Pro Gln Lys Gln Lys Ser Gly Asp Thr Thr Leu Gly Pro	
960 965 970	
gaa cga gcc atg tcc cca gtc aca att act aca ttt tcc aga gag aag	2976
Glu Arg Ala Met Ser Pro Val Thr Ile Thr Thr Phe Ser Arg Glu Lys	
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Thr Pro Glu Ser Gly Arg Gly Ala Phe Ala Asp Arg Pro Thr Ser Pro	
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Ile Gln Ile Met Thr Val Ser Thr Ser Ala Ala Pro Ala Glu Ile Ala	
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Val Ser Pro Glu Ser Gln Glu Met Pro Met Gly Arg Thr Ile Leu Lys	
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Ser Pro Val Ile Thr Val Arg Pro Val Asn Val Thr Ala Glu Lys Glu	
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Val Ser Thr Gly Thr Val Leu Arg Ser Pro Arg Asn His Leu Ser Ser	
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cgg cct ggt gca agc aaa gtg acg agc act atc acc ata aca ccg gtc 3408
 Arg Pro Gly Ala Ser Lys Val Thr Ser Thr Ile Thr Ile Thr Pro Val
 1120 1125 1130

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 Thr Thr Ser Ser Ala Arg Gly Thr Gln Ser Val Ser Gly Gln Asp Gly
 1135 1140 1145 1150

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 Ser Ser Gln Arg Pro Thr Pro Thr Arg Ile Pro Met Ser Lys Gly Met
 1155 1160 1165

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 Lys Ala Gly Lys Pro Val Val Ala Ala Pro Gly Ala Gly Asn Leu Thr
 1170 1175 1180

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 Lys Phe Glu Pro Arg Ala Glu Thr Gln Ser Met Lys Ile Glu Leu Lys
 1185 1190 1195

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 1200 1205 1210

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ttcattctgtt tgtgccagtt ctttacctgt actaatttaa gttttaaata ttgtgtttat 3765

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4247

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Ser Glu Asp Ala Lys Lys Lys Lys Ser Asn Arg Lys Glu Asp Asp
35 40 45

Val Met Ala Ser Gly Thr Val Lys Arg His Leu Lys Thr Ser Gly Glu
50 55 60

Cys Glu Arg Lys Thr Lys Lys Ser Leu Glu Leu Ser Lys Glu Asp Leu
65 70 75 80

Ile Gln Leu Leu Ser Ile Met Glu Gly Glu Leu Gln Ala Arg Glu Asp
85 90 95

Val Ile His Met Leu Lys Thr Glu Lys Thr Lys Pro Glu Val Leu Glu
100 105 110

Ala His Tyr Gly Ser Ala Glu Pro Glu Lys Val Leu Arg Val Leu His
115 120 125

Arg Asp Ala Ile Leu Ala Gln Glu Lys Ser Ile Gly Glu Asp Val Tyr
130 135 140

Glu Lys Pro Ile Ser Glu Leu Asp Arg Leu Glu Glu Lys Gln Lys Glu
145 150 155 160

Thr Tyr Arg Arg Met Leu Glu Gln Leu Leu Leu Ala Glu Lys Cys His
165 170 175

Arg Arg Thr Val Tyr Glu Leu Glu Asn Glu Lys His Lys His Thr Asp
180 185 190

Tyr Met Asn Lys Ser Asp Asp Phe Thr Asn Leu Leu Glu Gln Glu Arg
195 200 205

Glu Arg Leu Lys Lys Leu Leu Glu Gln Glu Lys Ala Tyr Gln Ala Arg
210 215 220

Lys Glu Lys Glu Asn Ala Lys Arg Leu Asn Lys Leu Arg Asp Glu Leu
225 230 235 240

Val Lys Leu Lys Ser Phe Ala Leu Met Leu Val Asp Glu Arg Gln Met
245 250 255

His Ile Glu Gln Leu Gly Leu Gln Ser Gln Lys Val Gln Asp Leu Thr
260 265 270

Gln Lys Leu Arg Glu Glu Glu Glu Lys Leu Lys Ala Ile Thr Ser Lys
275 280 285

Ser Lys Glu Asp Arg Gln Lys Leu Leu Lys Leu Glu Val Asp Phe Glu
290 295 300

His Lys Ala Ser Arg Phe Ser Gln Glu His Glu Glu Met Asn Ala Lys
305 310 315 320

Leu Ala Asn Gln Glu Ser His Asn Arg Gln Leu Arg Leu Lys Leu Val
325 330 335

Gly Leu Thr Gln Arg Ile Glu Glu Leu Glu Glu Thr Asn Lys Asn Leu
340 345 350

Gln Lys Ala Glu Glu Glu Leu Gln Glu Leu Arg Asp Lys Ile Ala Lys
355 360 365

Gly Glu Cys Gly Asn Ser Ser Leu Met Ala Glu Val Glu Asn Leu Arg
370 375 380

Lys Arg Val Leu Glu Met Glu Gly Lys Asp Glu Glu Ile Thr Lys Thr
385 390 395 400

Glu Ser Gln Cys Arg Glu Leu Arg Lys Lys Leu Gln Glu Glu Glu His
405 410 415

His Ser Lys Glu Leu Arg Leu Glu Val Glu Lys Leu Gln Lys Arg Met

420	425	430
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435	440	445
Cys Thr Gln Leu His Leu Asn Leu Glu Lys Glu Lys Asn Leu Thr Lys		
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Asp Leu Leu Asn Glu Leu Glu Val Val Lys Ser Arg Val Lys Glu Leu		
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Glu Cys Ser Glu Ser Arg Leu Glu Lys Ala Glu Leu Ser Leu Lys Asp		
485	490	495
Asp Leu Thr Lys Leu Lys Ser Phe Thr Val Met Leu Val Asp Glu Arg		
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Leu Asn Lys Asn Phe Lys Val Glu Gln Gly Lys Val Met Asp Val Thr		
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Glu Lys Leu Ile Glu Glu Ser Lys Lys Leu Leu Lys Leu Lys Ser Glu		
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Met Glu Glu Lys Val Tyr Asn Leu Thr Arg Glu Arg Asp Glu Leu Ile		
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Gly Lys Leu Lys Ser Glu Glu Glu Lys Ser Ser Glu Leu Ser Cys Ser		
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Val Asp Leu Leu Lys Lys Arg Leu Asp Gly Ile Glu Glu Val Glu Arg		
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Glu Ile Thr Arg Gly Arg Ser Arg Lys Gly Ser Glu Leu Thr Cys Pro		
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Lys Arg Leu Gln Gln Leu Glu Val Val Glu Gly Asp Leu Met Lys Thr		
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Glu Asp Glu Tyr Asp Gln Leu Glu Gln Lys Phe Arg Thr Glu Gln Asp
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Lys Ala Asn Phe Leu Ser Gln Gln Leu Glu Glu Ile Lys His Gln Ile
675 680 685

Ala Lys Asn Lys Ala Ile Glu Lys Gly Glu Val Val Ser Gln Glu Ala
690 695 700

Glu Leu Arg His Arg Phe Arg Leu Glu Glu Ala Lys Ser Arg Asp Leu
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Lys Ala Glu Val Gln Ala Leu Lys Glu Lys Ile His Glu Leu Met Asn
725 730 735

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Val Leu Asn Leu Thr Lys Glu Leu Glu Leu Ser Lys Arg Tyr Ser Arg
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785 790 795 800

Thr Ser Thr Gly Val Gln Thr Asp Ala Val Ser Gly Glu Ala Ala Glu
805 810 815

Glu Glu Thr Pro Ala Val Phe Ile Arg Lys Ser Phe Gln Glu Glu Asn
820 825 830

His Ile Met Ser Asn Leu Arg Gln Val Gly Leu Lys Lys Pro Val Glu
835 840 845

Arg Ser Ser Val Leu Asp Arg Tyr Pro Pro Ala Ala Asn Glu Leu Thr
850 855 860

Met Arg Lys Ser Trp Ile Pro Trp Met Arg Lys Arg Glu Asn Gly Pro
865 870 875 880

Ser Ile Thr Gln Glu Lys Gly Pro Arg Thr Asn Ser Ser Pro Gly His
885 890 895

Pro Gly Glu Val Val Leu Ser Pro Lys Gln Gly Gln Pro Leu His Ile
900 905 910

Arg Val Thr Pro Asp His Glu Asn Ser Thr Ala Thr Leu Glu Ile Thr
915 920 925

Ser Pro Thr Ser Glu Glu Phe Phe Ser Ser Thr Thr Val Ile Pro Thr
930 935 940

Leu Gly Asn Gln Lys Pro Arg Ile Thr Ile Ile Pro Ser Pro Asn Val
945 950 955 960

Met Pro Gln Lys Gln Lys Ser Gly Asp Thr Thr Leu Gly Pro Glu Arg
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Ala Met Ser Pro Val Thr Ile Thr Thr Phe Ser Arg Glu Lys Thr Pro
980 985 990

Glu Ser Gly Arg Gly Ala Phe Ala Asp Arg Pro Thr Ser Pro Ile Gln
995 1000 1005

Ile Met Thr Val Ser Thr Ser Ala Ala Pro Ala Glu Ile Ala Val Ser
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Pro Glu Ser Gln Glu Met Pro Met Gly Arg Thr Ile Leu Lys Val Thr
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Ala Asn Ile Ile Thr Thr Glu Asp Asn Lys Ile His Ile His Leu Gly
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Ser Gln Phe Lys Arg Ser Pro Gly Thr Ser Gly Glu Gly Val Ser Pro
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Val Ile Thr Val Arg Pro Val Asn Val Thr Ala Glu Lys Glu Val Ser
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Thr Gly Thr Val Leu Arg Ser Pro Arg Asn His Leu Ser Ser Arg Pro
1105 1110 1115 1120

Gly Ala Ser Lys Val Thr Ser Thr Ile Thr Ile Thr Pro Val Thr Thr

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Gln Arg Pro Thr Pro Thr Arg Ile Pro Met Ser Lys Gly Met Lys Ala					
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Gly Lys Pro Val Val Ala Ala Pro Gly Ala Gly Asn Leu Thr Lys Phe					
	1170		1175		1180
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